

HEAT CONTROLLER, INC.

Wall Mounted Multi-Zone Split System

MMC18DA-1

MMH18DA-1

MMC24DA-1

MMH24DA-1

MMC36TA-1

MMH36TA-1

Air Conditioning / Heat Pump

INSTALLATION INSTRUCTIONS

IMPORTANT!

Please read this instruction sheet completely before installing the product.

This air conditioning system meets strict safety and operating standards. As the installer or service person, it is an important part of your job to install or service the system so it operates safely and efficiently.



WARNING

- Installation or repairs made by unqualified persons can result in hazards to you and others. Installation **MUST** comply with local building codes or, in the absence of local codes, with the National Electrical Code NFPA 70/ANSI C1-1993 or current edition and Canadian Electrical Code Part 1 CSA C.22.1.
- The information contained in this manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments.
- Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury and/or death.

CAUTION: Improper installation, adjustment, alteration, service or maintenance can void the warranty.

The weight of the condensing unit requires caution and proper handling procedures when lifting or moving to avoid personal injury. Use care to avoid contact with sharp or pointed edges.

Safety Precautions

- Always wear safety glasses and work gloves when installing equipment.
- Never assume electrical power is disconnected. Check with meter and equipment.
- Keep hands out of fan areas when power is connected to equipment.
- R-410A causes frostbite burns.
- R-410A is toxic when burned.

NOTE TO INSTALLING DEALER: The Owners Instructions and Warranty are to be given to the owner or prominently displayed near the indoor Air Handler Unit.



Special warnings

When wiring:

Electrical shock can cause severe personal injury or death. Only a qualified, experienced electrician should attempt to wire this system.

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause injury or death.
- Ground the unit following local electrical codes.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.

When transporting:

Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut your fingers.

When installing...

... **in a wall:** Make sure the wall is strong enough to hold the unit's weight.

It may be necessary to construct a strong wood or metal frame to provide added support.

... **in a room:** Properly insulate any tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.

... **in moist or uneven locations:** Use a raised concrete pad or concrete blocks provide a solid, level foundation for the outdoor unit. This prevents water damage and abnormal vibration.

... **in an area with high winds:** Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

... **in a snowy area(for Heat Pump Model):** Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.

When connecting refrigerant tubing

- Keep all tubing runs as short as possible.
- Use the flare method for connecting tubing.
- Check carefully for leaks before starting the test run.

When servicing

- Turn the power OFF at the main power box(mains) before opening the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site after you finish, remembering to check that no metal scraps or bits of wiring have been left inside the unit being serviced.

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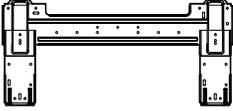
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Required Tools

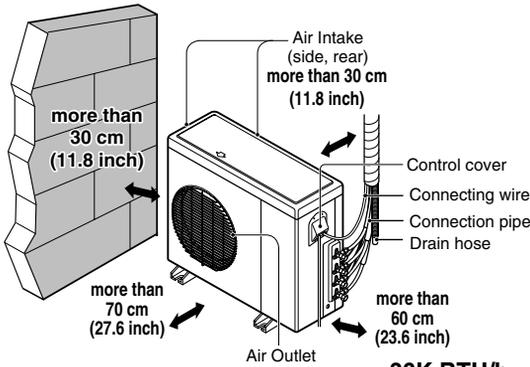
- Level gauge
- Screw driver
- Electric drill
- Hole core drill (ø 70 mm/ø 1.97 inch)
- Flaring tool set
- Specified torque wrenches
1.8 kg.m, 4.2 kg.m, 5.5 kg.m, 6.6 kg.m
(13 lbf.ft, 30 lbf.ft, 47.7 lbf.ft)
(different depending on model No.)
- Adjustable wrench
- A glass of water
- Hexagonal wrench(4 mm/0.16 inch)
- Refrigerant Gas Leak Detector
- Vacuum pump
- Gauge manifold
- Owner's manual
- Thermometer
- Remote Control Holder

Installation Parts Provided

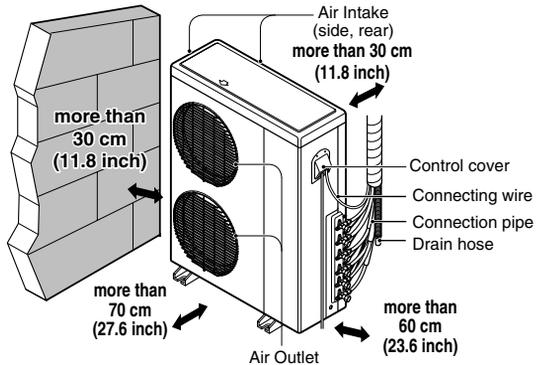
Standard Type

<p>Installation plate</p>	<p>Type "A" screws and plastic anchors</p>
	
<p>Type "B" screws</p>	<p>Remote Control Holder</p>
	

18/24K BTU/h



36K BTU/h



Safety Precautions

To prevent injury to the user or other people and property damage, the following instructions must be followed.

■ Incorrect operation due to ignoring instructions will cause harm or damage. The seriousness is classified by the following indications.

⚠ WARNING This symbol indicates the possibility of death or serious injury.

⚠ CAUTION This symbol indicates the possibility of injury or damage.

■ Meanings of symbols used in this manual are as shown below.

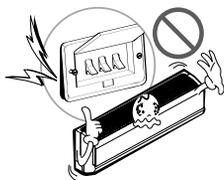
	Be sure not to do.
	Be sure to follow the instruction.

⚠ WARNING

■ Installation

Do not use a defective or underrated circuit breaker. Use this appliance on a dedicated circuit.

- There is risk of fire or electric shock.



For electrical work, contact the dealer, seller, a qualified electrician, or an Authorized Service Center.

- Do not disassemble or repair the product. There is risk of fire or electric shock.



Always electrically ground the product.

- There is risk of fire or electric shock.



Install the panel and the cover of control box securely.

- There is risk of fire or electric shock.



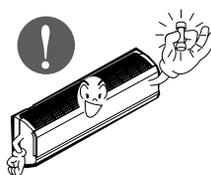
Always install a dedicated circuit and breaker.

- Improper wiring or installation may cause fire or electric shock.



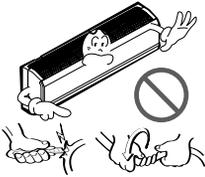
Use the correctly rated breaker or fuse.

- There is risk of fire or electric shock.



Do not modify or extend the power cable.

- There is risk of fire or electric shock.



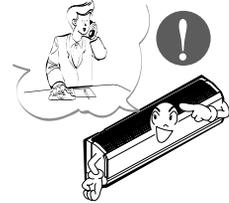
Be cautious when unpacking and installing the product.

- Sharp edges could cause injury. Be especially careful of the case edges and the fins on the condenser and evaporator.



For installation, always contact the dealer or an Authorized Service Center.

- There is risk of fire, electric shock, explosion, or injury.



Do not install the product on a defective installation stand.

- It may cause injury, accident, or damage to the product.



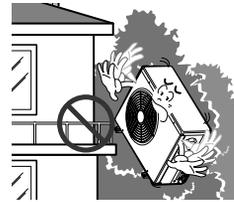
Do not let the air conditioner run for a long time when the humidity is very high and a door or a window is left open.

- Moisture may condense and dampen or damage furniture.



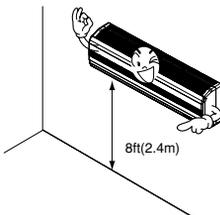
Be sure the installation area does not deteriorate with age.

- If the base collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.



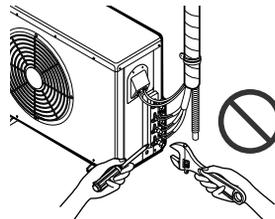
Install the indoor unit on the wall where the height from the floor is more than 8 ft. (2.4m).

- There are sharp moving parts that could cause personal injury.



Do not handle the pipe by yourself(customer)

- High-Pressure refrigerant may cause personal injury.



■ Operation

Do not store or use flammable gas or combustibles near the product.

- There is risk of fire or failure of product.

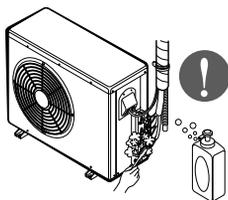


▲ CAUTION

■ Installation

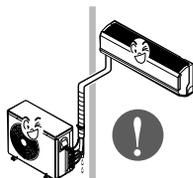
Always check for gas (refrigerant) leakage after installation or repair of product.

- Low refrigerant levels may cause failure of product.



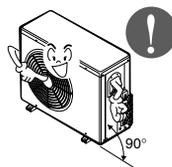
Install the drain hose to ensure that water is drained away properly.

- A bad connection may cause water leakage.



Keep level even when installing the product.

- To avoid vibration or water leakage.



Do not install the product where the sound or hot air from the outdoor unit could be offensive to neighbors.

- It may cause a problem for your neighbors.



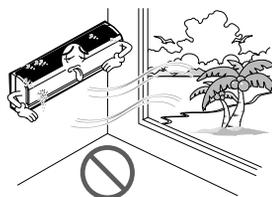
Use two or more people to lift and transport the product.

- Avoid personal injury.



Do not install the product where it will be exposed to salt spray directly.

- It may cause corrosion on the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.



Installation of Indoor, Outdoor Unit

Read completely, then follow step by step.

Select the best location

Indoor unit

1. Does not have any heat or steam near the unit.
2. Select a place where there are no obstacles in front of the unit.
3. Make sure that condensation drainage can be conveniently routed away.
4. Do not install near a doorway.
5. Ensure the unit is unobstructed, allow proper space on all sides according to the arrows and distance measurements in the figures.
6. Use a stud finder to locate studs to prevent unnecessary damage to the wall.



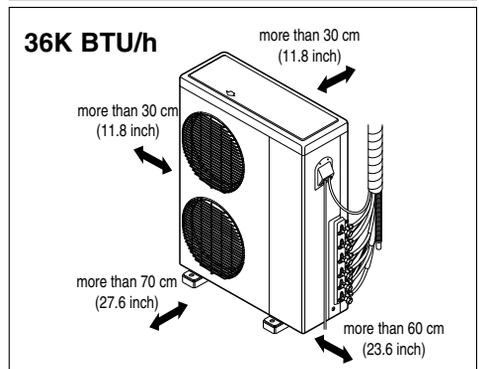
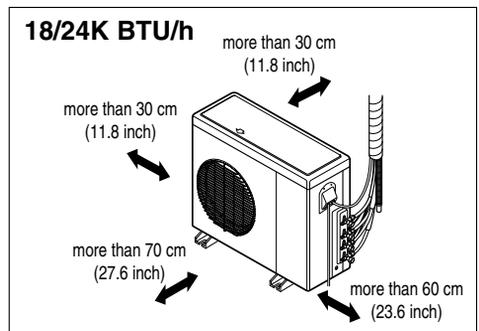
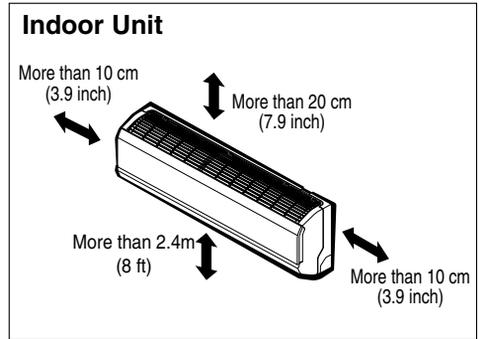
CAUTION: Install the indoor unit on the wall where the height from the floor is more than 2.4 m (8 ft).

Outdoor unit

1. If an awning is built over the unit to prevent direct sunlight or rain exposure, make sure that heat radiation from the condenser is not restricted.
2. Ensure the unit is unobstructed, allow proper space on all sides according to the arrows and distance measurements in the figures.
3. Do not place animals and plants in the path of the warm air.
4. Take the air conditioner weight into account and select a place where noise and vibration are minimum.
5. Select a place so that the warm air and sound from the air conditioner does not disturb neighbors.

Rooftop Installations:

If the outdoor unit is installed on a roof structure, be sure to level the unit. Ensure the roof structure and anchoring method are adequate for the unit location. Consult local codes regarding rooftop mounting.



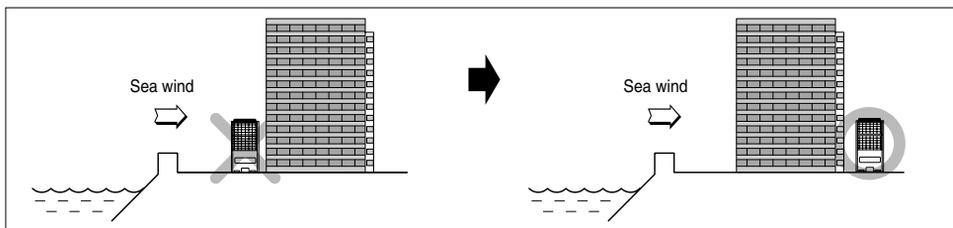
Seaside Applications and Installation

⚠ CAUTION

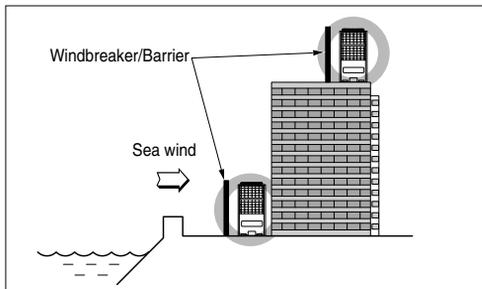
1. Air conditioners should not be installed in areas where corrosive gases, such as acid or alkaline gas, are produced.
2. Do not install the product where it could be exposed to sea wind (salty wind) directly. It can result in corrosion to the product. Particularly on the condenser and evaporator fins, could cause product malfunction or inefficient performance.
3. If the outdoor unit is installed close to the seaside, ensure that it is not exposed directly to the sea wind.

1. Selecting the location(Outdoor Unit)

- 1) If the outdoor unit is to be installed close to the seaside, direct exposure to the sea wind should be avoided. Install the outdoor unit on the opposite side of the sea wind direction.



- 2) To install the outdoor unit on the seaside, set up a windbreaker/barrier, to lessen the unit's exposure to sea air



- It should be strong enough (like concrete) to obstruct the wind from the sea.
- The height and width should be more than 150% of the outdoor unit.
- A minimum of 70cm (27.6inches) of space between outdoor unit and the windbreaker/barrier for easy air flow.

- 3) Select a well-drained place.

Periodic (more than once/year) cleaning of the dust or salt particles stuck on the heat exchanger using water is recommended.

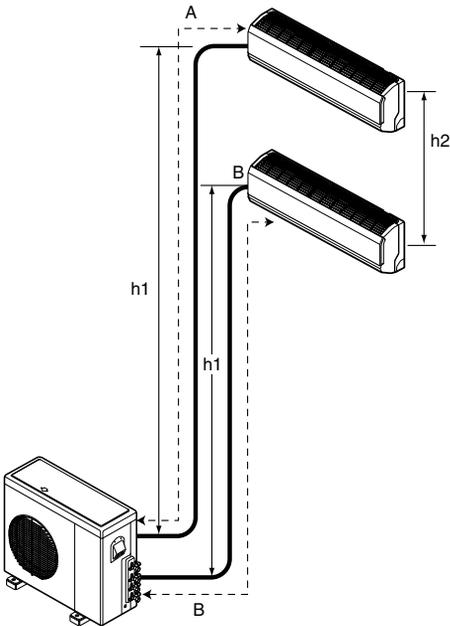
Piping length and elevation

Multi-Zone Piping Recommendations:

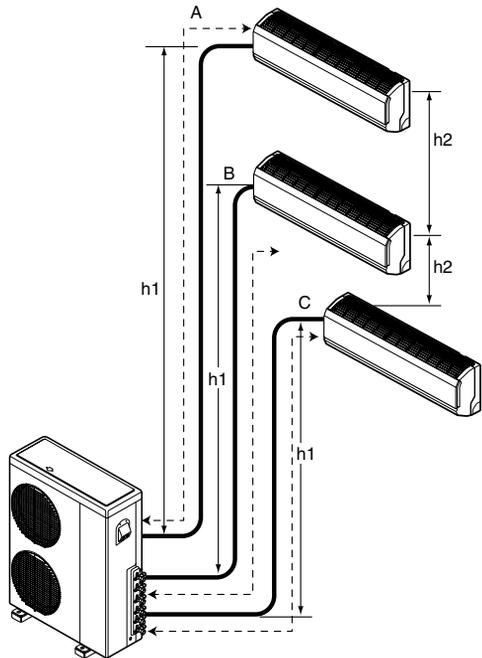
Capacity	Max total length of all pipes (A+B/A+B+C)	Max length of each pipe (A/B/C)	Min length of each pipe (A/B/C)	Max Elevation between each indoor unit and outdoor unit (h1)	Max elevation between indoor units (h2)
18K BTU/h	30 m (100 ft)	15 m (50 ft)	3 m (10 ft)	7.5 m (25 ft)	7.5 m (25 ft)
24K BTU/h	30 m (100 ft)	15 m (50 ft)	3 m (10 ft)	7.5 m (25 ft)	7.5 m (25 ft)
36K BTU/h	45 m (150 ft)	15 m (50 ft)	3 m (10 ft)	7.5 m (25 ft)	7.5 m (25 ft)

Indoor Capacity	Pipe Size			
	Gas (Flare)	Liquid (Flare)	Standard Length	Additional Refrigerant
9K BTU/h	9.52 mm (3/8")	6.35 mm (1/4")	7.5 m (25 ft)	20 g/m (0.22 oz/ft)
12K BTU/h	9.52 mm (3/8")	6.35 mm (1/4")	7.5 m (25 ft)	20 g/m (0.22 oz/ft)

18/24K BTU/h



36K BTU/h

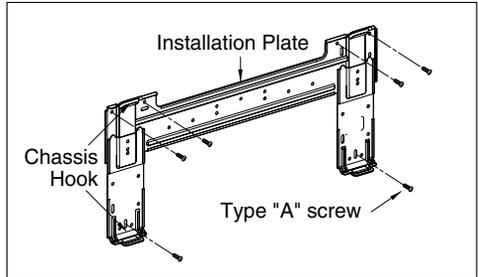


CAUTION: Capacity is based on standard length and maximum allowance length based on reliability.

Mounting Installation Plate

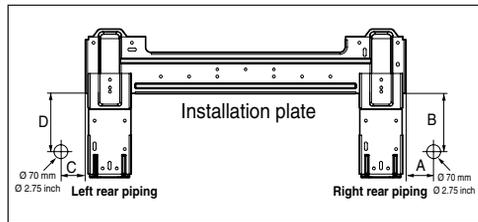
The wall you select should be strong and solid enough to prevent vibration

1. Mount the installation plate on the wall with type "A" screws. If mounting the unit on a concrete wall, use anchor bolts.
 - Mount the installation plate horizontally using a level.



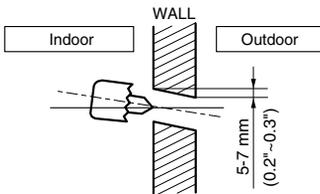
2. Measure the wall and mark the centerline. It is also important to use caution concerning the location of the installation plate—routing of the wiring to power outlets is through the walls typically.

CHASSIS (Grade)	Distance mm (inch)			
	A	B	C	D
9K BTU/h	50 (1.97)	105 (4.13)	59 (2.32)	105 (4.13)
12K BTU/h	65 (2.56)	110 (4.33)	85 (3.35)	110 (4.33)



Drilling the hole in the wall

- Drill the piping hole with a $\varnothing 70$ mm ($\varnothing 2.75$ inch) hole core drill. Drill the piping hole at either the right or the left with the hole slightly slanted to the outdoor side.



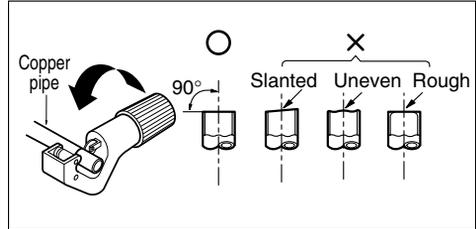
Flaring Work and Connection of Piping

Flaring work

Main cause for gas leakage is due to defect in flaring work. Carry out the correct flaring work by using the following procedures.

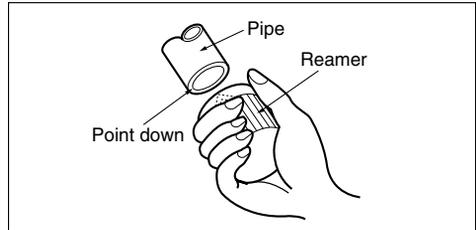
Cut the pipes

1. Use the piping kit accessory or the pipes purchased locally.
2. Measure the distance between the indoor and the outdoor unit.
3. Cut the pipes a little longer than measured distance.
4. Cut the cable 1.5 m (5.0 ft) longer than the pipe length.



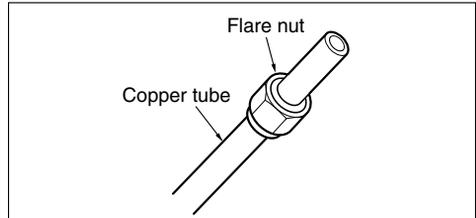
Burrs removal

1. Completely remove all burrs from the cut cross section of pipe/tube.
2. Put the end of the copper tube/pipe in a downward direction as you remove burrs in order to avoid dropping burrs into the tubing.



Putting flare nuts on

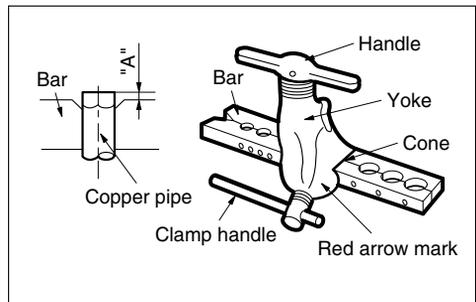
1. Remove flare nuts attached to indoor and outdoor unit, then put them on pipe/tube having completed burr removal.
(not possible to put them on after flaring work)



Flaring work

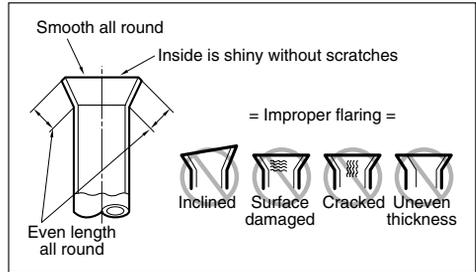
1. Carry out flaring work using flaring tool as shown below.
2. Firmly hold copper pipe in a bar in the dimension shown in the table below.

Outside diameter		A	
mm	inch	mm	inch
Ø6.35	1/4	1.1~1.3	0.4 - 0.5
Ø9.52	3/8	1.5~1.7	0.6 - 0.7



Check

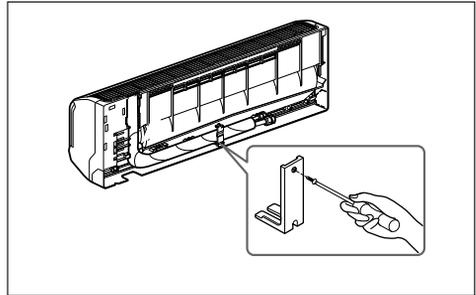
1. Compare the flared work with the figure on the right.
2. If a flared section is defective, cut it off and repeat the flaring process again.



Connecting the Piping

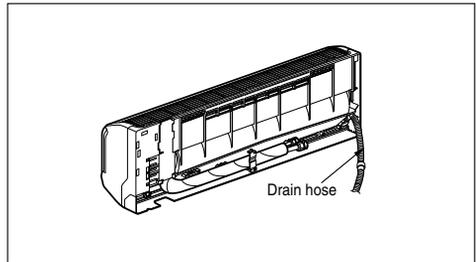
Indoor

1. Prepare the indoor unit's piping and drain hose for installation through the wall.
2. Remove the plastic tubing retainer (see the illustration on the right) and pull the tubing and drain hose away from chassis.



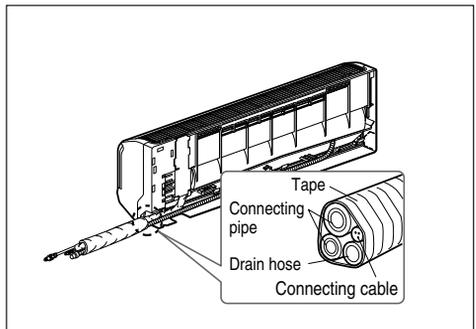
For right rear piping

1. Route the indoor tubing and the drain hose in the direction of rear right.
2. Insert the connecting cable into the indoor unit from the outdoor unit through the piping hole.
 - Do not connect the cable to the indoor unit.
 - Make a small loop with the cable for easy connection later.
3. Tape the tubing, drain hose, and the connecting on cable. Be sure that the drain hose is located on the lowest side of the bundle. Locating on the upper side can cause the condensation to overflow in the drain pan inside the indoor unit.



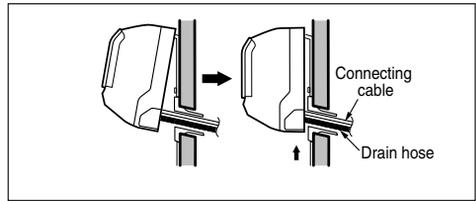
⚠ CAUTION

If the drain hose is routed inside the room, insulate the hose with an insulation material* so that dripping from "sweating"(condensation) will not damage furniture or floors.
 *Foamed polyethylene or equivalent is recommended.



4. Indoor unit installation

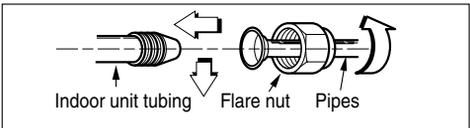
Hook the indoor unit onto the upper portion of the installation plate.(Engage the two hooks of the rear top of the indoor unit with the upper edge of the installation plate.) Ensure that the hooks are properly seated on the installation plate by moving it left and right.



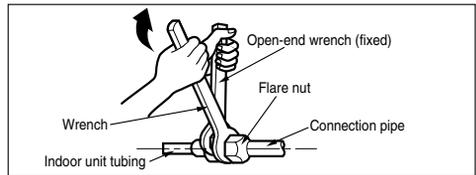
Press the lower left and right sides of the unit against the installation plate until the hooks engage into their slots(clicking sound).

Connecting the piping to the indoor unit and drain hose to drain pipe.

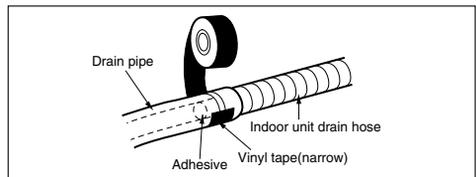
1. Align the center of the pipes and sufficiently tighten the flare nut by hand.
2. Tighten the flare nut with a wrench.



Outside diameter		Torque
mm	inch	kgf.m (lbf-ft)
Ø6.35	1/4	1.8 ~ 2.5 (13)
Ø9.52	3/8	3.4 ~ 4.2 (20)

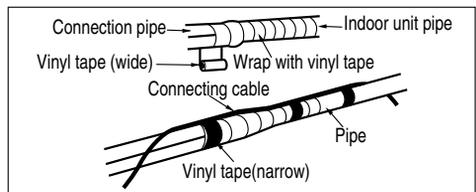
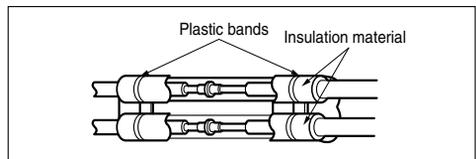


3. Next, extend the indoor unit's drain hose. Then attach the drain pipe.

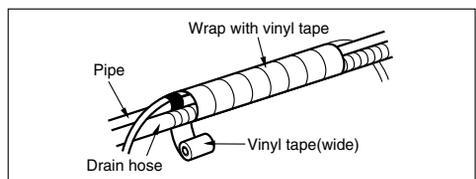


Wrap the insulation material around all connections.

1. Overlap the connection pipe insulation material and the indoor unit pipe insulation material. Bind them together with vinyl tape so that there is no gap.
2. Wrap the area which accommodates the rear piping housing section with vinyl tape.

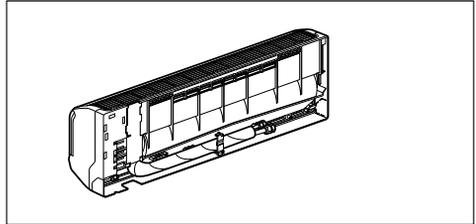
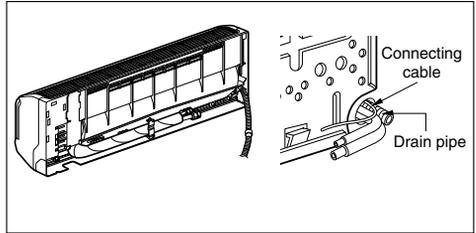


3. Bundle the piping and drain hose together by wrapping them with vinyl tape for enough to cover where they fit into the rear piping housing section.

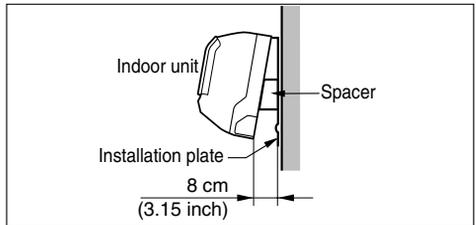


For left rear piping

1. Route the indoor tubing and the drain hose to the required piping hole position.
2. Insert the piping, drain hose, and the connecting cable into the piping hole.
3. Insert the connecting cable into the indoor unit.
 - Don't connect the cable to the indoor unit.
 - Make a small loop with the cable for easy connection later.
4. Tape the drain hose and the connecting cables.

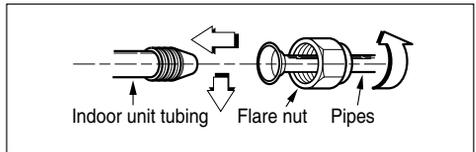


5. Indoor unit installation
 - Hang the indoor unit from the hooks at the top of the installation plate.
 - Insert the spacer between the indoor unit and the installation plate and separate the bottom of the indoor unit from the wall.



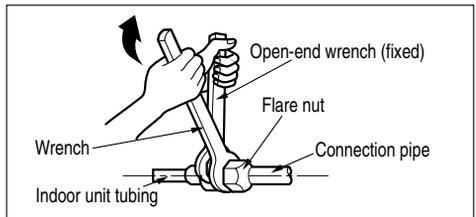
Connecting the piping to the indoor unit and the drain hose to drain pipe.

1. Align the center of the pipes and sufficiently tighten the flare nut by hand.

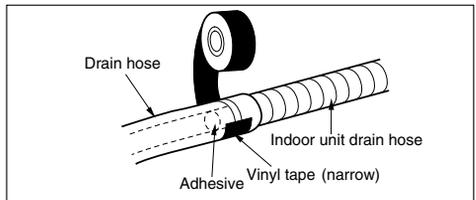


2. Tighten the flare nut with a wrench.

Outside diameter		Torque
mm	inch	kgf.m (lbf-ft)
Ø6.35	1/4	1.8 ~ 2.5 (13)
Ø9.52	3/8	3.4 ~ 4.2 (20)

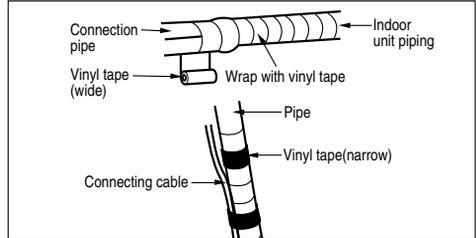
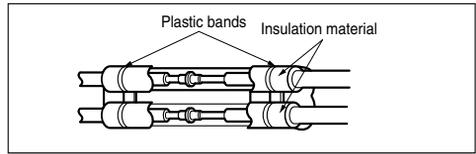


3. Next, extend the indoor unit's drain hose. Then attach the drain pipe.

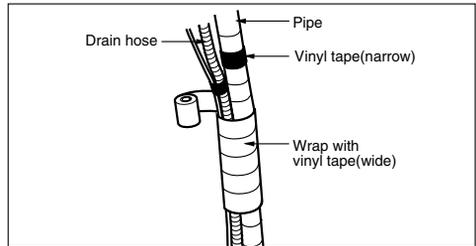


Wrap the insulation material around the connecting portion.

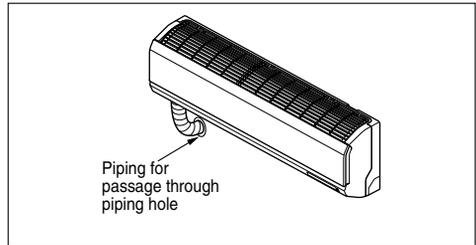
1. Overlap the connection pipe insulation and the indoor unit pipe heat insulation material. Bind them together with vinyl tape so that there is no gap.
2. Wrap the area which accommodates the rear piping housing section with vinyl tape.



3. Bundle the piping and drain hose together by wrapping them with vinyl tape over the range within which they fit into the rear piping housing section.

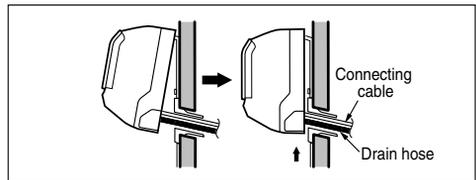


Reroute the piping and the drain hose across the back of the chassis.



Indoor unit installation

1. Remove the spacer.
2. Ensure that the hooks are properly seated on the installation plate by moving it left and right.
3. Press the lower left and right sides of the unit against the installation plate until the hooks engage into their slots (clicking sound).

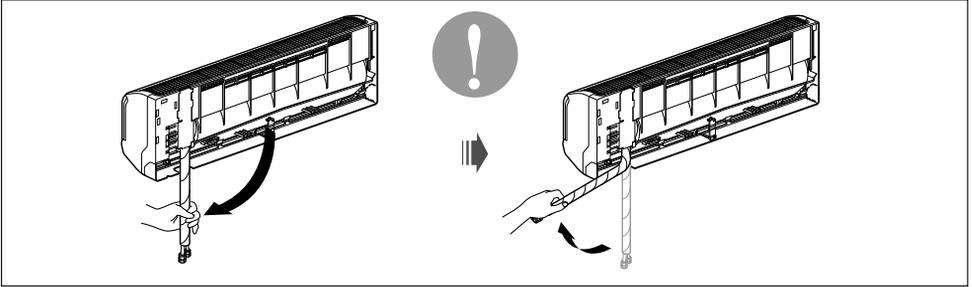


⚠ CAUTION

Installation Information. For left piping. Follow the instruction below.

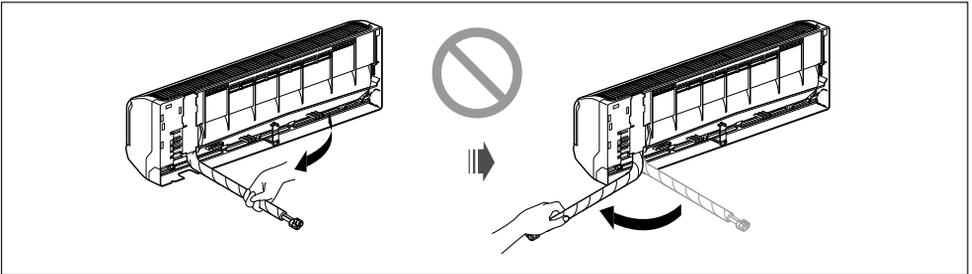
Best Practice

- Press on the upper side of clamp and unfold the tubing to slowly downward.



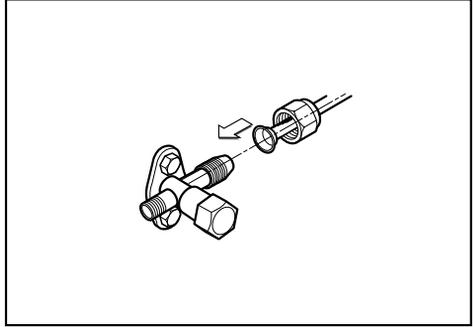
Worst Practice

- Bending the pipe from right to left may cause damage to the tubing.



Outdoor

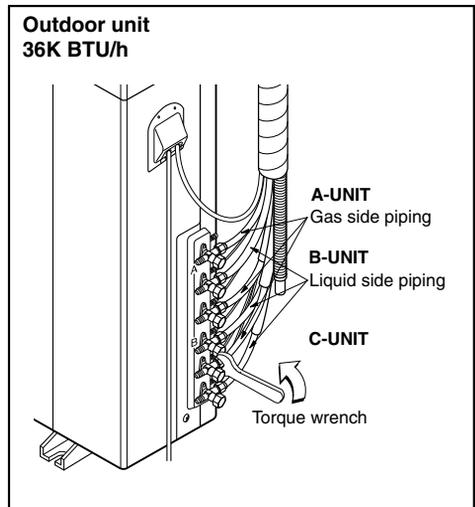
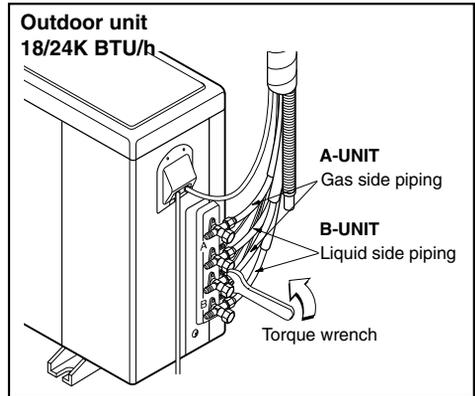
Align the center of the piping and sufficiently tighten the flare nut by hand.



Finally, tighten the flare nut with a torque wrench until the wrench clicks.

- When tightening the flare nut with the torque wrench, ensure the direction for tightening follows the arrow on the wrench.

Outside diameter		Torque
mm	inch	kgf.m (lbf-ft)
Ø6.35	1/4	1.8 ~ 2.5 (13)
Ø9.52	3/8	3.4 ~ 4.2 (20)



Connecting the Cable between Indoor Unit and Outdoor Unit

Connect the cable to the Indoor unit

Connect the cable to the indoor unit by connecting the wires to the terminals on the control board individually according to the outdoor unit connection. (Ensure that the color of the wires of the outdoor unit and the terminal No. are the same as those of the indoor unit.)

The ground wire should be longer than the common wires.

The circuit diagram is subject to change without notice.

When installing, refer to the electrical diagram behind the front panel of Indoor Unit.

The wiring for the outdoor unit can be found on the inside of the Outdoor Unit control cover.

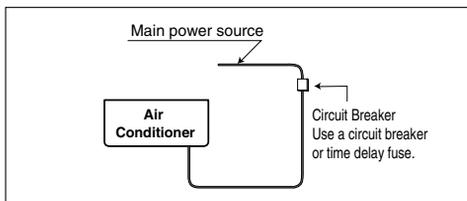


RECOMMENDATION:

- The circuit diagram is subject to change without notice.
- Be sure to connect wires according to the wiring diagram.
- Connect the wires firmly, so that they can not be pulled out easily.
- Connect the wires according to color codes by referring to the wiring diagram.

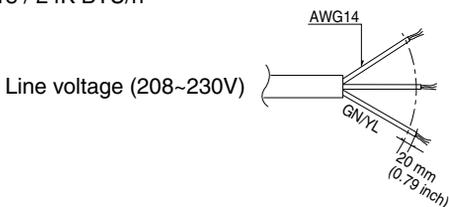


RECOMMENDATION: Provide a circuit breaker between power source and the outdoor unit as shown below.

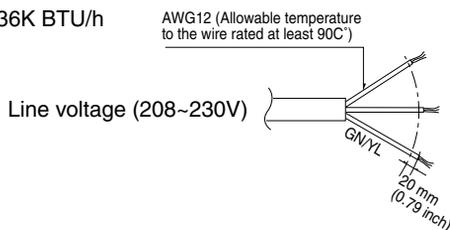


RECOMMENDATION: The power cord connected to the outdoor unit should comply with the following specifications: ETL recognized and CSA certified.

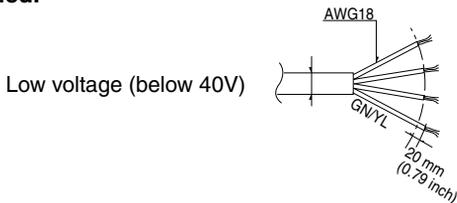
18 / 24K BTU/h



36K BTU/h



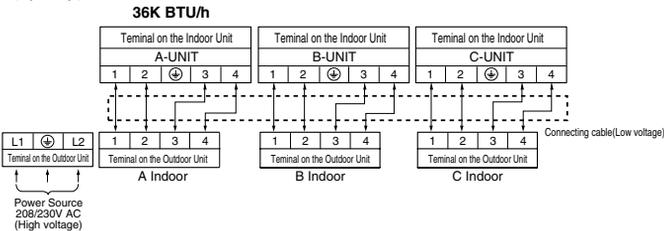
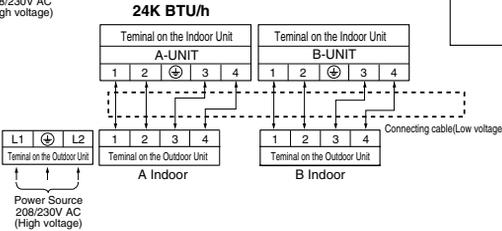
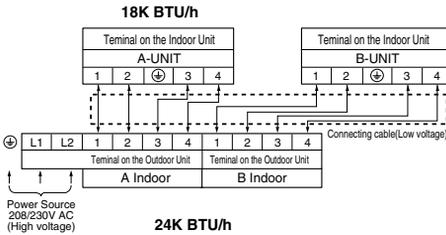
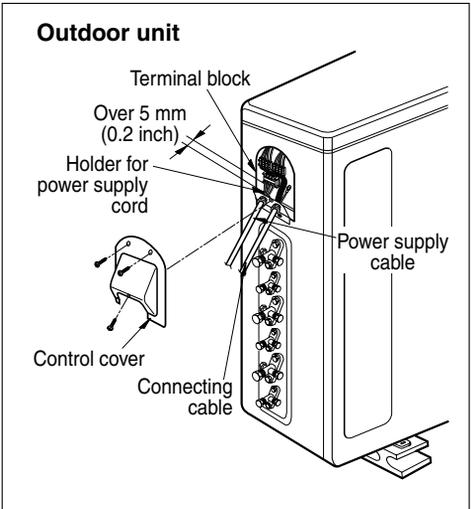
The power connecting cable connected to the indoor and outdoor unit should be comply with the following specifications: ETL recognized and CSA certified.



RECOMMENDATION: When using the separate wires as the power cord, please secure the separate wires into the control box panel using tie wraps to hold all wires together in place.

Connect the cable to the Outdoor unit

1. Remove the control cover from the unit by loosening the screws.
Connect the wires to the terminals on the control board individually per the following.
2. Secure the cable onto the control board with the holder (clammer).
3. Re-attach the control cover to the original position using the screws.



NOTICE :

1. Separately wire the high and low voltage lines.
2. Use heat resistant electrical wiring capable of withstanding temperatures up to 75°C(167°F).
3. Use outdoor waterproof connection cable rated for at least 300V for the connection between indoor and outdoor unit. (For example, Type SJO-WA)

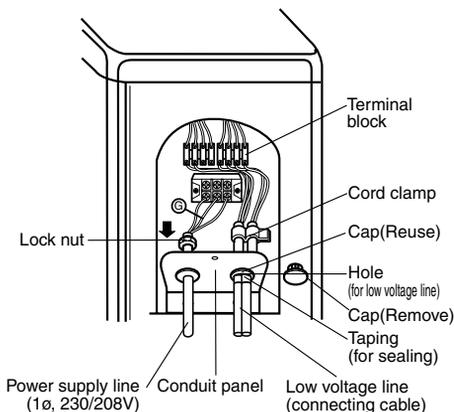


WARNING:

- Be sure to comply with local and national codes while running the wire from the indoor unit to the outdoor unit(size of wire and wiring method, etc).
- Every wire must be connected firmly.
- No wire should be allowed to touch refrigerant tubing, the compressor or any moving parts.

Methods of connecting the cable

- (1) Remove two-caps on the conduit panel.
(for low voltage line)
- (2) Pull the connection cable through conduit.
- (3) After conduit is through the panel, secure the nut on the opposite side of panel.
- (4) Pass the connection cable through the hole.
- (5) Properly connect the cable onto the terminal block.
- (6) Secure the connection cable with cord clamp provided on the unit to reduce strain at the terminal when the connection cable is pulled outside up to a 35 pound weight



WARNING: Loose wiring may cause the terminal to overheat or result in unit malfunction. A fire hazard may also exist. Therefore, be sure all wiring is tightly connected.

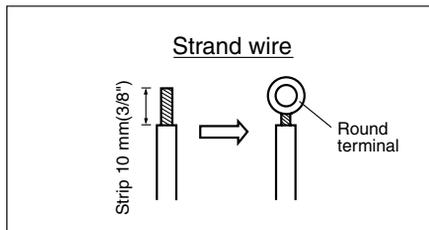
When connecting each power wire to the corresponding terminal, follow instructions "How to connect wiring to the terminals" and fasten the wire tightly using the screw on of the terminal plate.

How to connect wiring to the terminals

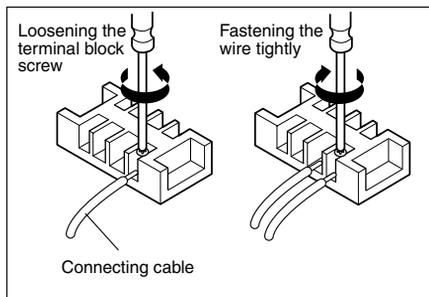
■ For strand wiring

- (1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to expose the strand wiring about 10 mm (3/8").
- (2) Using a screwdriver, remove the terminal screw(s) on the terminal plate.
- (3) Using a round terminal fastener or pliers, securely clamp each stripped wire end with a round terminal.
- (4) Position the round terminal wire, and replace by tightening the terminal screw using a screwdriver.

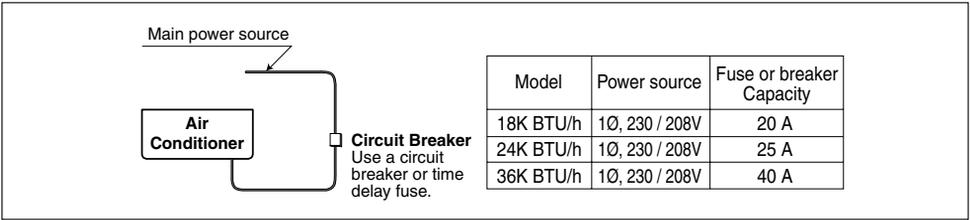
High voltage



Low voltage



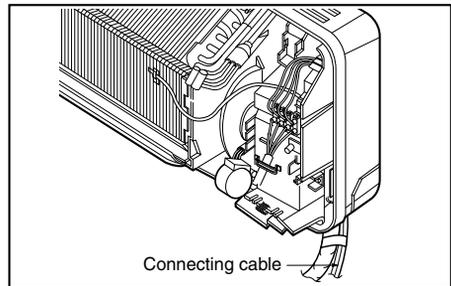
CAUTION: Provide a circuit breaker between power source and the unit as shown below.



Connect the cable to the indoor unit

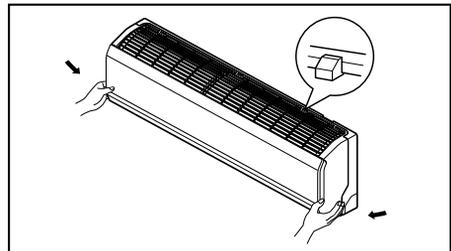
1. Connect the wires to the terminals on the control board individually according to the outdoor unit connection.

- Ensure that the color of the wires of outdoor unit and the terminal No. are the same as those of indoor unit respectively.



2. Attach the Grille onto the cabinet.

- Grasp the lower left and right side of the Grille and engage four tabs on the top inside edge of the chassis.
- Press the Grille toward the chassis until it goes back into place.

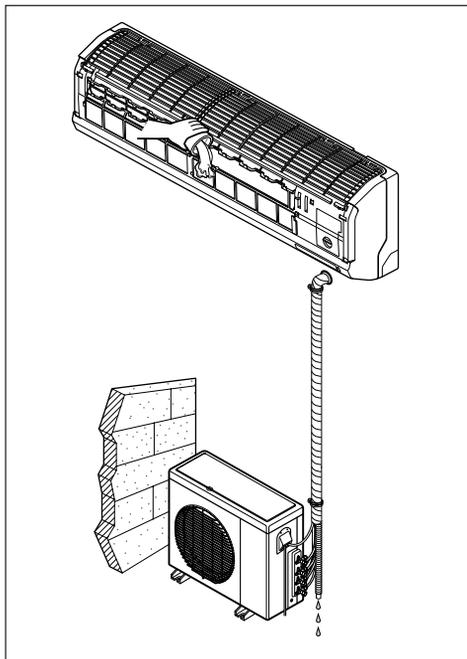


Checking the Drainage, Insulating the Pipe and Special Piping Applications

Checking the drainage

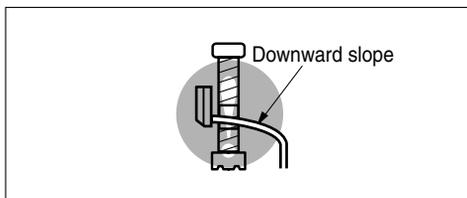
To check the drainage.

1. Pour a glass of water into the evaporator.
2. Ensure the water flows through the drain hose of the indoor unit without any leakage and goes out through the drain exit.

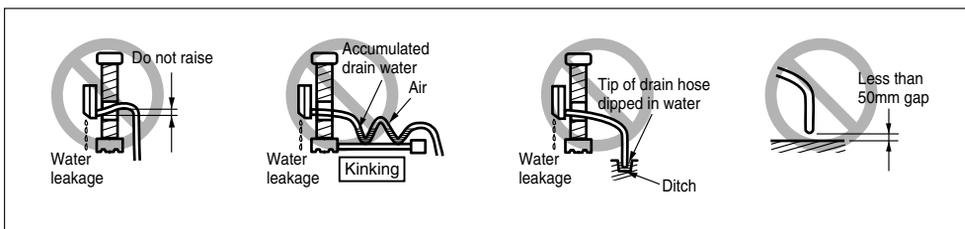


Drain piping

1. The drain hose should point downward for optimum drainage.



2. Incorrect Installation Examples:



Insulating the Pipe and Special Piping Applications

Insulate the piping by wrapping the connecting portion of the indoor unit with insulation material and secure it with two kinds of vinyl tape.

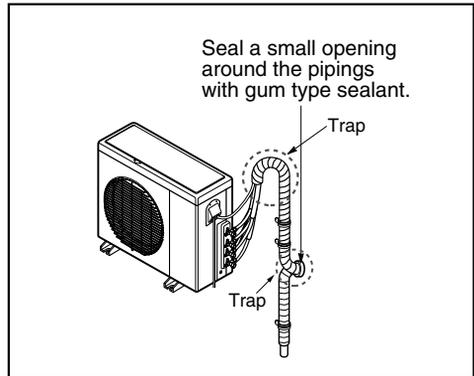
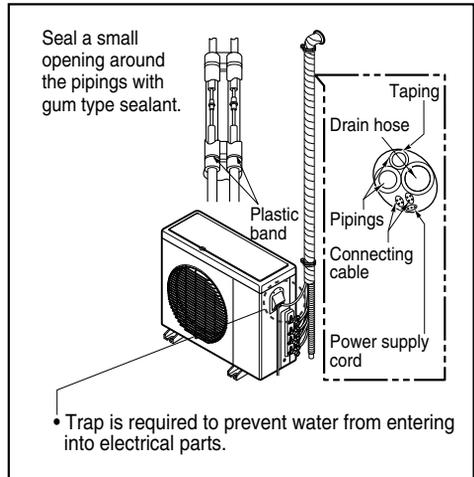
- If you want to connect an additional drain hose, the end of the drain outlet should be routed above the ground. Secure the drain hose appropriately.

In cases where the outdoor unit is installed below the indoor unit perform the following:

1. Tape the piping, drain hose and connecting cable from down to up.
2. Secure the taped piping along the exterior wall using saddle or equivalent.

In cases where the Outdoor unit is installed above the Indoor unit perform the following.

1. Tape the piping and connecting cable from down to up.
2. Secure the taped piping along the exterior wall. Form a trap to prevent water entering the room.
3. Secure the piping onto the wall using a saddle or equivalent.



Air Purging and Evacuation

Air and moisture remaining in the refrigerant system have undesirable effects as indicated below.

1. Pressure in the system rises.
2. Operating current rises.
3. Cooling(or heating) efficiency drops.
4. Moisture in the refrigerant circuit may freeze and block capillary tubing.
5. Water may lead to corrosion of parts in the refrigeration system.

Therefore, the indoor/outdoor unit and connecting tube must be checked for leaks and vacuumed to remove incondensable gas and moisture in the system.

Leak Checking

Preparation

- Check that each tube(both liquid and gas side tubes) between the indoor and outdoor units have been properly connected and all wiring for the test run has been completed. Remove the service valve caps from both the gas and the liquid sides on the outdoor unit. Check that both the liquid and the gas side service valves on the outdoor unit are kept closed at this stage.

Leakage test

- Connect the manifold valve(with pressure gauges) and dry nitrogen gas cylinder to this service port with charge hoses.

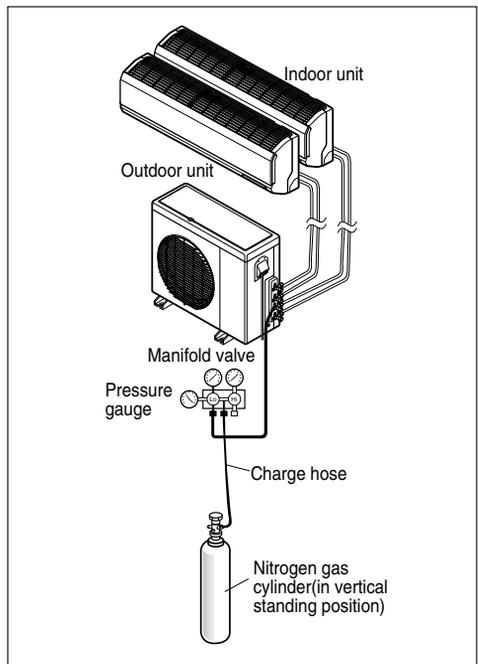
CAUTION: Be sure to use a manifold valve for leak testing. The high side manifold valve must always be kept closed.

- Pressurize the system to no more than 150 P.S.I.G. with dry nitrogen gas and close the cylinder valve when the gauge reading reached 150 P.S.I.G. Next, test for leaks with liquid soap.

CAUTION: To avoid nitrogen entering the refrigerant system in a liquid state, the top of the cylinder must be higher than its bottom when you pressurize the system. Usually, the cylinder is used in a vertical standing position.

NOTICE : Leakage testing should be done for each indoor unit connection set, separately.

1. Do a leakage test of all joints of the tubing(both indoor and outdoor) and both gas and liquid side service valves with soap bubbles. Bubbles indicate a leak. Be sure to wipe off the soap with a clean cloth.
2. After the system is found to be free of leaks, relieve the nitrogen pressure by loosening the charge hose connector at the nitrogen cylinder. When the system pressure is reduced to normal, disconnect the hose from the cylinder.



Evacuation

1. Connect the charge hose end described in the preceding steps to the vacuum pump to evacuate the tubing and indoor unit. Confirm the "Lo" knob of the manifold valve is open. Then, run the vacuum pump. The operation time for evacuation varies with tubing length and capacity of the pump.

[Each Room] The vacuum pump must be operated less than 0.8torr (0.015 psi) of the gage pressure.

2. When the desired vacuum is reached, close the "Lo" knob of the manifold valve and stop the vacuum pump.

Finishing the job

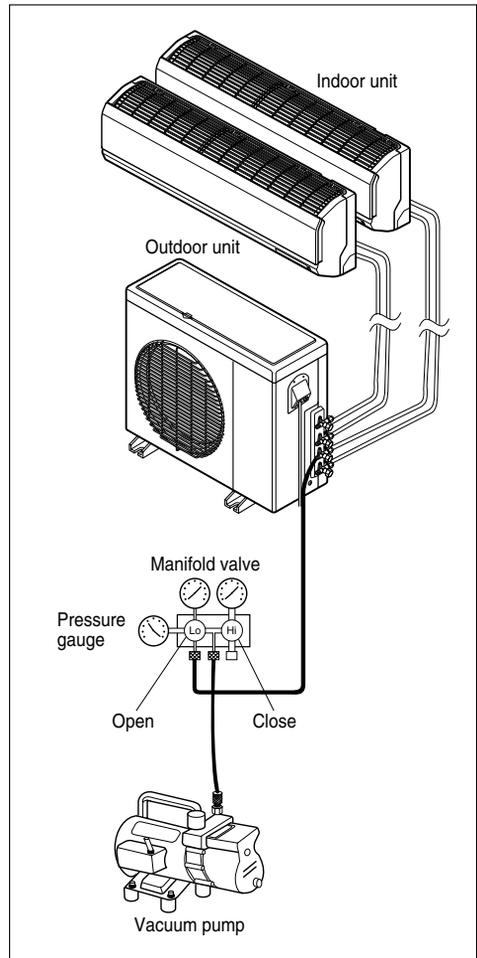
1. With a service valve wrench, turn the valve stem of liquid side valve counter-clockwise to fully open the valve.
2. Turn the valve stem of gas side valve counter-clockwise to fully open the valve.
3. Loosen the charge hose connected to the gas side service port slightly to release the pressure, then remove the hose.
4. Replace the flare nut and its bonnet on the gas side service port and fasten the flare nut securely with an adjustable wrench. This process is very important to prevent leakage from the system.
5. Replace the valve caps at both gas and liquid side service valves and fasten them tight.

This completes air purging with a vacuum pump.

The air conditioner is now ready for test running.

NOTICE

: Repeat evacuation procedure for each indoor unit.



Charging

- Each outdoor unit is factory charged (see rating plate) for the evaporator as well as a 7.5 m (25 ft) line set for each indoor line.
Any time total line set is used either shorter or longer than the nominal, which is for Single Zone = 7.5m, Dual Zone = 15m, and Tri-Zone = 22.5 (Single Zone = 25ft, Dual Zone = 50ft, and Tri Zone = 75 ft), the line set length the refrigerant charge has to be adjusted.
- Whether the line set is made shorter or longer you must adjust the charge based on how many ft of tubing are either added or removed based on 20 g (0.22 oz) of R410A per meter(foot).

Capacity	Max total length of all pipes (A+B+C)	Max length of each pipe (A/B/C)	Min length of each pipe (A/B/C)	Max Elevation between each indoor unit and outdoor unit (h1)	Max elevation between indoor units (h2)	Additional Refrigerant
18K BTU/h	30 m (100 ft)	15 m (50 ft)	3 m (10 ft)	7.5 m (25 ft)	7.5 m (25 ft)	20 g/m (0.22 oz/ft)
24K BTU/h	30 m (100 ft)	15 m (50 ft)	3 m (10 ft)	7.5 m (25 ft)	7.5 m (25 ft)	20 g/m (0.22 oz/ft)
36K BTU/h	45 m (150 ft)	15 m (50 ft)	3 m (10 ft)	7.5 m (25 ft)	7.5 m (25 ft)	20 g/m (0.22 oz/ft)

Example: A 80 ft line set is used for tri - zone 5 additional ft X 0.22 ounces per foot= add 1.1 ounces of R410A

Important:

If you are ever uncertain of the unit charge, reclaim, evacuate and weigh in the correct charge using the charge amount specified on the unit's rating plate, adjusting for line sets longer or shorter than 7.5 m(25 ft) for each indoor unit.

Test Running

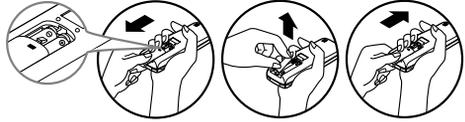
1. Check that all tubing and wiring have been properly connected.
2. Check that the gas and liquid side service valves are fully open.

Prepare remote control

Remove the battery cover by pulling it according to the arrow direction.

Insert new batteries making sure that the (+) and (-) of battery are installed correctly.

Reattach the cover by pushing it back into position.



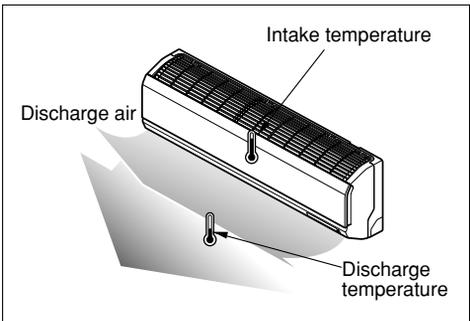
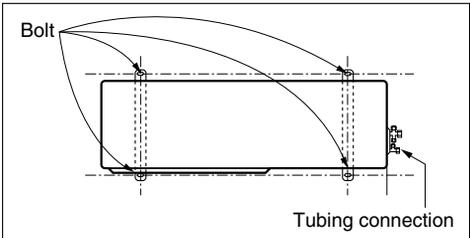
NOTICE :

- Use 2 AAA(1.5volt) batteries. Do not use rechargeable batteries.
- Remove the batteries from the remote control if the system is not going to be used for a long time.

Evaluation of the performance

Operate all indoor units for 15~20 minutes, then check the system refrigerant charge:

1. Measure the pressure of one of the gas side service valves.
2. Measure the temperature of the intake and discharge of air.
3. Ensure the difference between the intake air temperature and the discharge air is more than 8°C(14.4°F).
4. For reference, optimum gas pressure for cooling is shown below.



Refrigerant	Outside ambient TEMP.	The pressure of the gas side service valve.
R410A	35°C (95°F)	8.5 ~ 9.5 kg/cm ² G (120 ~ 135 P.S.I.G)

NOTICE : If the actual pressure is higher than shown, the system is most likely over-charged, and charge should be removed. If the actual pressure is lower than shown, the system is most likely undercharged, and charge should be added.

Important:

- ❑ Individual zones should be all in the same operation mode (Heating or Cooling mode)

Specifications and performance data subject to change without notice.

HEAT CONTROLLER, INC.

1900 WELLWORTH AVENUE • JACKSON, MICHIGAN 49203

THE QUALITY LEADER IN CONDITIONING AIR